CAMPS OF PREHISTORIC PEOPLE IN SEDGWICK COUNTY, KANSAS.

BY J. R. MEAD, WICHITA.

In the first exploration and settlement of the country adjacent to the Little and Great Arkansas rivers, in what is now Sedgwick county, Kansas, there were no evidences of previous occupation by savage or civilized people, such as mounds or broken pottery; and implements of stone were rarely found upon the surface. Yet the country was known to be a favorite camping-ground for Indian tribes, affording unlimited supplies of game, timber sufficient for their use and shelter, and pure, unfailing water in abundance, with fertile soil easily cultivated.

The alluvial soil, lacking stone on the surface, or cliffs of rock, furnished no material for enduring monuments or inscriptions.

The mound-building people did not flourish here, at least did not build mounds upon the convenient bluffs east of the river. If mounds were made in the valley, the tramping of buffalo and blowing winds may have reduced them to the common level. It is therefore evident that in seeking for traces of prehistoric people who may have occupied this valley, we must look beneath the surface; and here the expected evidence is found.

In 1864 the writer established a trading-post between the rivers, two miles above their junction, in a walnut grove, where converging bends of the rivers bring them near together, affording a beautiful and commanding location. Here hundreds of Indians camped, came and went, and built houses of logs or poles. Ten or fifteen years later this ground was a cultivated field, nothing indicating that it had been a scene of busy life, except a few stones and broken dishes; but every year the plow turns up, from deep in the ground, numerous stone implements of some former age and people, and unlike any found elsewhere in the country. The arrow-points, peculiar, all of one pattern, triangular, very small and delicate, lacking the usual notches, chips, and partly worked flint cores, show they were made where found. The material was similar to the chert formation about Joplin, Mo. Stone axes, and spear-points of jasper, were occasionally found, but no pottery.

Four miles south of Wichita, on the west side, eighty rods from the river, on the farm of Mr. Eldred, is the site of an ancient camp or village. Here are plowed up decayed· pottery and very beautiful arrow-points of a reddish stone, skillfully notched, and all of uniform make and appearance, entirely unlike those above described, evidently made by a different people from a different pattern, and of material brought from some other source.

East of the river, on Chisholm creek, two miles south of Wichita, in excavating earth for brick-making, there were found, one or two feet beneat hthe prairie sod, numerous broken and one entire vessel of pottery; also spear-heads and scrapers. Near the mouth of the same creek there is an old camp, covering eighty or more acres; here are plowed up pottery, arrow-points, knives, scrapers, hoes, axes, hammers, pipes, and grinding-stones, of many different patterns and material; among others, pipes and unworked stone from the red pipestone quarries of Dakota. These can be seen in the collection of Mr. Frank Ford, at Wichita. A few years since, the caving of a bank on the Little river exposed a pottery vessel six feet beneath the surface. No obsidian or painted and glazed pottery has been found in these camps, which indicates that they were not of, or visitors to, the Pueblo people of New Mexico.

The Indians who frequented· this region since it was first known to white men, did not make or use pottery; and as none has been found upon the surface, I conclude these camps may have, some of them at least, been made and occupied by unknown tribes many ages past.

The most remarkable find in this region, however, was made on the Whitewater river, twenty miles east of Wichita, and seems to date back in geologic times prior to the last general submergence of the country. At a point near Augusta the river has gradually deflected to the east cutting its way slowly into the valley, exposing the strata of a perpendicular bank some forty feet in height. The top of the bank is the general level of the valley, in which was growing an oak tree five feet in diameter. The first eighteen inches in depth is the usual dark surface soil; the next eight feet is yellow clay, apparently of the Loess formation common in Kansas. This clay rests upon a former surface soil two feet thick, of rich black loam; the line between the two is sharply defined. The black soil merges into clay below, which extends down to gravel resting upon the bed-rock of the river. On the surface of the black soil and under the eight feet of clay I found the remains of a camp, containing broken pottery, charcoal, ashes, burnt bones, and stones such as would be used in a camp fireplace. The bones resembled the leg-bones of deer. The black stratum of soil was undoubtedly the surface of the valley, rich in vegetable and animal life, at the time the aboriginal, antediluvian people feasted around their camp-fire, and broke their soup-bowl.

We are evidently not the first settlers of Kansas.

DIFFERENTIALS OF THE SECOND AND HIGHER ORDERS.

BY E. MILLER, LAWRENCE.

This memoir is written as an answer to one of many questions that have been addressed to the Department of Mathematics of the University. Such inquiries are of almost weekly occurrence. They cover ground that extends all the way from Problems in Percentage to "Curves of Pursuit." They embrace the "settlement of estates;" disputes arising from the "foreclosure of mortgages;" the winding-up of "joint-stock companies;" the contents of cisterns; the "horse power" of mill-dams; the properties of various kinds of curves; the Theory of Probabilities, and the elimination of differentials. More than once has the chair of mathematics been called upon to elaborate the principles, the notation, and the application of differentials, and to show why all differential expressions, of second or higher orders, when compared with those of the first order or degree, vanish completely from the work in hand, without affecting the result. To have answered this question in detail, by unfolding the demonstration step by step, as generally given by either of the methods of the Calculus, would have required more time and leisure than I had at my command. The proposer of the question was evidently laboring under the impression that to throw away the quantity $dxdy$ from such an expression as $xdy+ydx+dxdy$, was an absurd thing to do; believing that if dx and dy each had a value, however small, then $dxdy$ would also have a value, although indefinitely smaller than the former. Now, whether we use the Infinitesimal Method, in which "a quantity is conceived under such a form, or law, as to be necessarily less than any assignable quantity," and according to which infinitesimals of the *second, third,* and *higher* orders, may be dropped as not affecting the result; or, the "Method of Limits," as enunciated by one of the discoverers of the Calculus, that "quantities, and ratios of quantities, which in any finite time converge continually to equality, and before the end of that time approach nearer the one to the other than by any difference, become ultimately equal," *we know* that dropping the higher orders will give beyond a peradventure the exact result.